PF NT COOPERATION TREAT

From the INTERNATIONAL BUREAU

PCT NOTIFICATION OF ELECTION (PCT Rule 61.2) Date of mailing (day/month/year) 15 February 2001 (15.02.01) International application No.	Commissioner US Department of Commerce United States Patent and Trademark Office, PCT 2011 South Clark Place Room CP2/5C24 Arlington, VA 22202 ETATS-UNIS D'AMERIQUE in its capacity as elected Office
PCT/IE00/00084	PE1120
International filing date (day/month/year) 05 July 2000 (05.07.00)	Priority date (day/month/year) 06 July 1999 (06.07.99)
Applicant	
FRITSCH, Joseph, Frederick et al	
The designated Office is hereby notified of its election in the demand filed with the International Prelim 11 Januar in a notice effecting later election filed with the	ninary Examining Authority on: y 2001 (11.01.01)
2. The election X was was was not was not made before the expiration of 19 months from the pri Rule 32.2(b).	ority date or, where Rule 32 applies, within the time limit under

The International Bureau of WIPO 34, chemin des Colombettes

Authorized officer

Pascal Piriou



(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference		of Transmittal of International Search Report					
PE1120	ACTION (Form PC1/ISA/2	220) as well as, where applicable, item 5 below.					
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)					
PCT/IE 00/00084	05/07/2000	06/07/1999					
Applicant							
FRITSCH, Joseph Frederick							
This International Search Report has bee according to Article 18. A copy is being tra	n prepared by this International Searching Aut ansmitted to the International Bureau.	hority and is transmitted to the applicant					
	of a total of3 sheets. a copy of each prior art document cited in this	report.					
Basis of the report							
	international search was carried out on the ba less otherwise indicated under this item.	sis of the international application in the					
the international search w Authority (Rule 23.1(b)).	ras carried out on the basis of a translation of t	he international application furnished to this					
b. With regard to any nucleotide an was carried out on the basis of the		ternational application, the international search					
	onal application in written form.						
filed together with the inte	rnational application in computer readable for	n.					
furnished subsequently to this Authority in written form.							
	this Authority in computer readble form.						
the statement that the sub international application a	esequently furnished written sequence listing d s filed has been furnished.	oes not go beyond the disclosure in the					
the statement that the info furnished	ormation recorded in computer readable form is	s identical to the written sequence listing has been					
2. Certain claims were fou	nd unsearchable (See Box I).						
3. Unity of Invention is lac	king (see Box II).						
4. With regard to the title,							
X the text is approved as su	bmitted by the applicant.						
the text has been establis	hed by this Authority to read as follows:						
5. With regard to the abstract,							
X the text is approved as su	bmitted by the applicant.						
	hed, according to Rule 38.2(b), by this Authori date of mailing of this international search rep	ty as it appears in Box III. The applicant may, ort, submit comments to this Authority.					
6. The figure of the drawings to be publ	ished with the abstract is Figure No.	1					
as suggested by the appli	cant.	None of the figures.					
because the applicant fail	ed to suggest a figure.						
X because this figure better	characterizes the invention.						



PC 00/00084

A.	CLA	ASSIF	CATION	1 OF	SUBJECT	MATTER		
I	PC	7	G11	B7/	SUBJECT 12	G11B	33/1	4

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 $\begin{array}{ll} \mbox{Minimum documentation searched (classification system followed by classification symbols)} \\ \mbox{IPC 7} & \mbox{G11B} \end{array}$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

C. DOCUM	OCUMENTS CONSIDERED TO BE RELEVANT						
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.					
Х	US 5 088 083 A (NORMAN J. OLSON) 11 February 1992 (1992-02-11)	1-15					
Y	column 3, l̃ine 26 -column 4, line 13; figures 1-4 	16,17					
X	DE 198 33 577 A (TDK CORP) 4 February 1999 (1999-02-04) column 3, line 32 -column 4, line 12 column 7, line 20 - line 39; figure 4	1-3					
X	GB 2 306 759 A (TDK CORPORATION) 7 May 1997 (1997-05-07)	1,3, 35-38, 41-44					
	page 23, line 14 -page 25, line 36; figures 13-17	1.11					
	-/						

Further documents are listed in the continuation of box C.	Patent family members are listed in annex.
 Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed 	 "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
Date of the actual completion of the international search	Date of mailing of the international search report
13 October 2000	24/10/2000
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentiaan 2	Authorized officer
NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Chaumeron, B

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International	Application	No
PQ	00/0008	34

0.0	-N POOUNTATO CONCINETATO CO	PQ 00/00084
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 01, 29 January 1999 (1999-01-29) & JP 10 275440 A (KYUSHU HITACHI MAXELL LTD), 13 October 1998 (1998-10-13) abstract	16,17
X	PATENT ABSTRACTS OF JAPAN vol. 0123, no. 96, 21 October 1988 (1988-10-21) & JP 63 136371 A (SONY CORP), 6 August 1988 (1988-08-06) abstract	41,45
X	WO 95 24039 A (ROBERT D. MARTIN) 8 September 1995 (1995-09-08) page 3, line 5 -page 4, line 30; figures 1-4	1
X	WO 98 53455 A (DIGITAL PAPYRUS CORPORATION) 26 November 1998 (1998-11-26) page 2, line 10 - line 21; figures 1,2	1
X	DE 39 25 902 A (HITACHI LTD) 22 March 1990 (1990-03-22) column 8, line 47 -column 9, line 6; figure 7	1

1

Inform patent family members

00/00084 Patent document **Publication** Publication Patent family cited in search report date member(s) date US 5088083 Α 11-02-1992 NONE DE 19833577 Α 04-02-1999 JP 11045417 A 16-02-1999 GB 2306759 Α 07-05-1997 JP 2819492 B 30-10-1998 JP 7006431 A 10-01-1995 JP 7033185 A 03-02-1995 JP 7169030 A 04-07-1995 JP 2899940 B 02-06-1999 JP 04-07-1995 7169081 A GB 2312084 A,B 15-10-1997 DE 4419477 A 08-12-1994 07-12-1994 2278710 A.B GB US 5966360 A 12-10-1999 JP 10275440 Α 13-10-1998 NONE JP 63136371 Α 08-06-1988 JP 8034008 B 29-03-1996 WO 9524039 ΑU Α 08-09-1995 6587494 A 18-09-1995 ΕP 0748505 A 18-12-1996 WO 9853455 26-11-1998 NONE Α DE 3925902 Α 22-03-1990 JP 2168481 A 28-06-1990

International Application No



PCT

REC'D 12 OCT 2001

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant'	s or ag	gent's file reference	T		Con Notific	ation of Tours in the last		
PE1120)		FOR FURTHER A	CTION		ation of Transmittal of International Examination Report (Form PCT/IPEA/416)		
Internation	nal app	olication No.	International filing date	(day/month	/year)	Priority date (day/month/year)		
PCT/IE	00/00	084	05/07/2000			06/07/1999		
Internation G11B7/		ent Classification (IPC) or na	ational classification and IP	C				
Applicant								
FRITSC	H, Jo	seph Frederick et al.						
1. This and i	intern s tran	ational preliminary exam smitted to the applicant a	ination report has been according to Article 36.	prepared	by this Inte	rnational Preliminary Examining Authority		
2. This	REPO	ORT consists of a total of	7 sheets, including this	s cover sh	eet.			
t t	This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).							
Thes	These annexes consist of a total of sheets.							
3. This	report	contains indications rela	ting to the following iter	ns:				
;	\boxtimes	Basis of the report						
II		Priority						
Ш		Non-establishment of o	pinion with regard to no	velty, inve	ntive step a	and industrial applicability		
IV		Lack of unity of invention		•	•	and the second second		
V	×	Reasoned statement ur citations and explanation	nder Article 35(2) with re	egard to no	ovelty, inver	ntive step or industrial applicability;		
VI		Certain documents cite						
VII		Certain defects in the in	ternational application					
VIII	\boxtimes	Certain observations on	the international applic	ation				
Date of sub	missio	n of the demand		Date of co	mpletion of th	nis report		
11/01/20	11/01/2001			10.10.200	1			
		address of the international ning authority:		Authorized	l officer	SON SONES MILITA		
)	Euro D-80 Tel	pean Patent Office 298 Munich -49 89 2399 - 0 Tx: 523656 +49 89 2399 - 4465	epmu d	Chaume	ron, B No. +49 89 2	2399 2662		



International application No. PCT/IE00/00084

 Basis of the report 	I. I	3asi	SO	f the	re	port
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1	the an	e receiving Office in	nents of the international application (Replacement sheets which have been furnished to response to an invitation under Article 14 are referred to in this report as "originally filed" to this report since they do not contain amendments (Rules 70.16 and 70.17)):						
	1-1	18	as originally filed						
	Cla	aims, No.:							
	1-4	17	as originally filed						
	Dra								
	1/3	-3/3	as originally filed						
2.	Wit lan	With regard to the language , all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.							
	The	These elements were available or furnished to this Authority in the following language: , which is:							
		the language of a t	ranslation furnished for the purposes of the international search (under Rule 23.1(b)).						
			blication of the international application (under Rule 48.3(b)).						
		the language of a t 55.2 and/or 55.3).	ranslation furnished for the purposes of international preliminary examination (under Rule						
3.	Wit inte	h regard to any nuc l rnational preliminary	eotide and/or amino acid sequence disclosed in the international application, the examination was carried out on the basis of the sequence listing:						
		contained in the int	ernational application in written form.						
		filed together with t	he international application in computer readable form.						
		furnished subseque	ently to this Authority in written form.						
		furnished subsequently to this Authority in computer readable form.							
		The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.							
		The statement that listing has been furn	the information recorded in computer readable form is identical to the written sequence nished.						
4.	The	amendments have	resulted in the cancellation of:						
		the description,	pages:						
		the claims,	Nos.:						



International application No. PCT/IE00/00084

		the drawings,	sheets:		
5.					ome of) the amendments had not been made, since they have beer as filed (Rule 70.2(c)):
		(Any replacement she report.)	eet contaii	ning such	amendments must be referred to under item 1 and annexed to this
6.	Add	litional observations, if	necessar	y:	
٧.		soned statement und tions and explanatio			ith regard to novelty, inventive step or industrial applicability;
1.	Stat	rement			
	Nov	elty (N)	Yes: No:	Claims Claims	1-15,35-38,41-47
	Inve	entive step (IS)	Yes: No:	Claims Claims	16-34,39,40
	Indu	istrial applicability (IA)	Yes: No:	Claims Claims	1-47

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made: see separate sheet

2. Citations and explanations see separate sheet



EXAMINATION REPORT - SEPARATE SHEET

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.) Reference is made to the following documents:

D1: US-A-5088083

D2: DE-A-19833577

D3: GB-A-2036759

D4: JP-A-10275440

D5: JP-A-63136371

2.) The subject-matter of claim 1 is anticipated by the disclosure of D1; for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D1:

Protective device (13) for protecting an interface means (11) of a read/write unit ('compact disc playing machine'),

the read and /or write unit comprising:

a receiving area (14) for receiving a data carrier,

the interface means (11) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (see figure 1); wherein the protective device comprises:

a data carrier (32) for engaging in the receiving area of the read and/or write unit, and a protecting means (33) carried on the carrier means for engaging the interface means (11) when the carrier means is engaged in the receiving area.

3.) The subject-matter of claim 1 is anticipated by the disclosure of D2, for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D2 (reference is made to figure 4 of D2):

Protective device (3) for protecting an interface means (A) of a read/write unit (Mini-disc player),

INTERNATIONAL PRELIMINARY

International application No. PCT/IE00/00084

EXAMINATION REPORT - SEPARATE SHEET

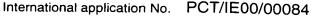
the read and /or write unit comprising:

a receiving area (implicitly disclosed in D2) for receiving a data carrier,

the interface means (A) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (implicitly disclosed in D2); wherein the protective device comprises:

a data carrier (1) for engaging in the receiving area of the read and/or write unit, and a protecting means (3) carried on the carrier means for engaging the interface means (A) when the carrier means is engaged in the receiving area.

- 4.) The subject-matter of claim 1 is anticipated by the disclosure of D3, for the following reason:
- the 6th embodiment disclosed in D3 (see D3, page 23 to page 24, 6th line from bottom; figures 13 to 17) anticipates the subject-matter of claim 1.
- 5.) The subject-matter of claim 1 is anticipated by the disclosure of D4 (see figure 1 and text of the English abstract).
- 6.) The additional feature of claim 2 is known from D2 (column 3, lines 61 to 65), or D3 (see D3, page 24, 6th to 10th lines from bottom).
- 7.) The additional feature to claim 3 is known from all the documents D1 to D4.
- 8.) The additional feature of claim 4 is known from D1 (see figure 4).
- 9.) The additional feature of claim 5 is known from D3 (see figure 14).
- 10.) The additional feature of claim 6 is known from D1.
- 11.) The additional features of claims 7 to 15 are known from D1.
- 12.) The subject-matter of claim 16 lacks an inventive step with respect to the combination of D1 and D4; for the following reasons: the features of claims 1,8 and 15 are known from D1. the objective problem corresponding to the additional feature of claim 16 can be formulated as follows: reducing the forces applied to the lens when the brush comes into contact with the lens.



EXAMINATION REPORT - SEPARATE SHEET

It appears that this problem is solves by D4 which suggests to give a certain orientation to the brush to avoid: 'a strong impact caused by te contact given to the objective lens" (see abstract of D4). A skilled person interpreting D4 would in an obvious manner consider a wide range as that specified in D4 (20° to 80°). It is noted that no specific reason is given in the description of the application justifying the limits of the claimed range.

Therefore the subject-matter of claim 16 is obvious with respect to the combination of D1 and D4.

13.) The range claimed in claim 17 is not known from the available prior art documents. However a doubt remains as to the presence of an inventive step regarding this range because no reason is given in the description justifying the values specified for the limits of the range.

14.) Claim 35:

The subject-matter of claims 35 to 38 is known from D3.

15.) Claim 41:

The subject-matter of claim 41 is anticipated by D3 (see D3, 6th embodiment, figure 13 to 16, page 23, 4th par. to page 25, bottom of the page; it can be seen from figure 14 that the cleaning member 16 does protect the head (14)), or D5.

- 16.) Additional features of claims 42 to 44 are known from D3.
- 17.) The method specified in claim 45 is known from D5 (see D5 abstract which indicates that during the cleaning process the lens is moved by the focusing mechanism i.e. along a vertical axis with respect to the disc plane).

18.) Claim 46:

A cleaning device according to claim 46 is known from D2 (see D2, column 7, lines 20 to 39).

19.) Claim 47:

The subject-matter of method claims 46 or 47 is anticipated by D2 (see D2, column 7, lines 20 to 39).

INTERNATIONAL PRELIMINARY **EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IE00/00084

20.) Remaining dependent claims:

It appears that all the features of the remaining dependent claims can be found in the documents D1 to D5. No specific feature of the dependent claims which could serve as a basis for new claims could be found.

Re Item VIII

Certain observations on the international application

- 1.) In the independent claims 1,35,41,46,47, the phrase 'of the type here before' leads to a lack of clarity of each of the claims because it is not clear to which text the claims refer to. The applicant's attention is drawn to the fact that a claim should normally not refer to the description (see PCT Guidelines Section IV part III 4. 10, Rule 6.2 a)).
- 2.) The plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection. Hence claims do not meet the requirements of Article 6 PCT.

PATENT COOPERATION TREATY

7.7	
ART COLOR	

From the: INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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F.F. GORMAN & CO 54 Merrion Square Dublin 2

WRITTEN OPINION

IRLANDE		WAITTEN OPINION			
·			(PCT Rule 66)		
		Date of mailing (day/month/year)	14.05.2001		
Applicant's or agent's file reference		REPLY DUE	within 3 month(s)		
PE1120			from the above date of mailing		
International application No.	International filing date (day/month/year)		Priority date (day/month/year)		
PCT/IE00/00084	05/07/2000		06/07/1999		
International Patent Classification (IPC) or both	ih national classification an	d IPC			
G11B7/12					
Applicant					
FRITSCH, Joseph Frederick et al.					
This written opinion is the first draw This opinion contains indications rel		•	ining Authority.		
I ⊠ Basis of the opinion					
II Priority					
III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability					

IV Lack of unity of invention

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability: citations and explanations supporting such statement

۷I Certain document cited

VII ☐ Certain defects in the international application

VIII Certain observations on the international application

The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit,

request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3.

For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.

For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.

For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 06/11/2001.

Name and mailing address of the international preliminary examining authority:

European Patent Office D-80298 Munich

Tel. +49 89 2399 - 0 Tx: 523656 epmu d

Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Chaumeron, B

Formalities officer (incl. extension of time limits)

Slater, S

Telephone No. +49 89 2399 2565







WRITTEN OPINION

I.	Basi	ie 1	٦f ·	the	n	in	ion
	Das:	. .	<i>,</i>	uic	vμ		101

1.	With regard to the elements of the international application (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed").						
	Des	scription, pages:					
	1-18	8	as originally filed				
	Cla	ims, No.:					
	1-47	7	as originally filed				
Drawings, sheets:							
	1/3-	3/3	as originally filed				
2.	With regard to the language , all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.						
	These elements were available or furnished to this Authority in the following language: , which is:						
		the language of a	translation furnished for the purposes of the international search (under Rule 23.1(b)).				
		the language of pu	ublication of the international application (under Rule 48.3(b)).				
		the language of a 55.2 and/or 55.3).	translation furnished for the purposes of international preliminary examination (under R	lule			
3.			cleotide and/or amino acid sequence disclosed in the international application, the ry examination was carried out on the basis of the sequence listing:				
		contained in the in	nternational application in written form.				
		filed together with	the international application in computer readable form.				
		furnished subsequ	uently to this Authority in written form.				
		furnished subsequ	uently to this Authority in computer readable form.				
			at the subsequently furnished written sequence listing does not go beyond the disclosur pplication as filed has been furnished.	e in			
		The statement that listing has been fu	at the information recorded in computer readable form is identical to the written sequence irnished.	e:			

☐ the description,

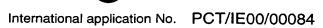
☐ the claims,

4. The amendments have resulted in the cancellation of:

pages:

Nos.:





		the drawings,	sheets:			
5.		This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):				
		(Any replacement sh report.)	eet containing	g such amendments must be referred to under item 1 and annexed to this		
6.	Add	litional observations, i	f necessary:			
V.	 Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability citations and explanations supporting such statement 					
1.		tement velty (N)	Claims	1-15,35-38,41-47		
	Inve	entive step (IS)	Claims	16-34,39,40		

2. Citations and explanations see separate sheet

Industrial applicability (IA)

VIII. Certain observations on the international application

Claims

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made: see separate sheet



Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.) Reference is made to the following documents:

D1: US-A-5088083

D2: DE-A-19833577

D3: GB-A-2036759

D4: JP-A-10275440

D5: JP-A-63136371

2.) The subject-matter of claim 1 is anticipated by the disclosure of D1; for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D1:

Protective device (13) for protecting an interface means (11) of a read/write unit ('compact disc playing machine'),

the read and /or write unit comprising:

a receiving area (14) for receiving a data carrier,

the interface means (11) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (see figure 1); wherein the protective device comprises:

a data carrier (32) for engaging in the receiving area of the read and/or write unit, and a protecting means (33) carried on the carrier means for engaging the interface means (11) when the carrier means is engaged in the receiving area.

3.) The subject-matter of claim 1 is anticipated by the disclosure of D2, for the following reasons:

it is indicated in the following where the features recited in the claim can be found in D2 (reference is made to figure 4 of D2):

Protective device (3) for protecting an interface means (A) of a read/write unit (Mini-disc player),



the read and /or write unit comprising:

a receiving area (implicitly disclosed in D2) for receiving a data carrier,

the interface means (A) being located in the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier (implicitly disclosed in D2); wherein the protective device comprises:

a data carrier (1) for engaging in the receiving area of the read and/or write unit, and a protecting means (3) carried on the carrier means for engaging the interface means (A) when the carrier means is engaged in the receiving area.

4.) The subject-matter of claim 1 is anticipated by the disclosure of D3, for the following reasons:

the applicant will appreciate that in particular the 6th embodiment disclosed in D3 (see D3, page 23 to page 24, 6th line from bottom; figures 13 to 17) anticipates the subject-matter of claim 1.

- 5.) The subject-matter of claim 1 is anticipated by the disclosure of D4 (see figure 1 and text of the English abstract).
- 6.) The additional feature of claim 2 is known from D2 (column 3, lines 61 to 65), or D3 (see D3, page 24, 6th to 10th lines from bottom).
- 7.) The additional feature to claim 3 is known from all the documents D1 to D4.
- 8.) The additional feature of claim 4 is known from D1 (see figure 4).
- 9.) The additional feature of claim 5 is known from D3 (see figure 14).
- 10.) The additional feature of claim 6 is known from D1.
- 11.) The additional features of claims 7 to 15 are known from D1.
- 12.) The subject-matter of claim 16 lacks an inventive step with respect to the combination of D1 and D4; for the following reasons: the features of claims 1,8 and 15 are known from D1. the objective problem corresponding to the additional feature of claim 16 can be formulated as follows:



reducing the forces applied to the lens when the brush comes into contact with the lens. It appears that this problem is solves by D4 which suggests to give a certain orientation to the brush to avoid: 'a strong impact caused by te contact given to the objective lens" (see abstract of D4). A skilled person interpreting D4 would in an obvious manner consider a wide range as that specified in D4 (20° to 80°). It is noted that no specific reason is given in the description of the application justifying the limits of the claimed range.

Therefore the subject-matter of claim 18 is obvious with respect to the combination of D1 and D4.

13.) The claimed range is not known from the available prior art documents. However a doubt remains as to the presence of an inventive step regarding this range because no reason is given in the description justifying the values specified for the limits of the range. If this feature is included in a future amended claim, then some arguments should be put forward by the applicant showing the presence of an inventive step.

14.) Claim 35:

The subject-matter of claims 35 to 38 is known from D3.

15.) Claim 41:

The subject-matter of claim 41 is anticipated by D3 (see D3, 6th embodiment, figure 13 to 16, page 23, 4th par. to page 25, bottom of the page; it can be seen from figure 14 that the cleaning member 16 does protect the head (14)), or D5

- 16.) Additional features of claims 42 to 44 are known from D3.
- 17.) The method specified in claim 45 is known from D5 (see D5 abstract which indicates that during the cleaning process the lens is moved by the focusing mechanism i.e. along a vertical axis with respect to the disc plane.

18.) Claim 46:

A cleaning device according to claim 46 is known from D2 (see D2, column 7, lines 20 to 39).

19.) Claim 47:





The subject-matter of method claims 46 or 47 is anticipated by D2 (see D2, column 7, lines 20 to 39).

20.) Remaining dependent claims:

It appears that all the features of the remaining dependent claims can be found in the documents D1 to D5. No specific feature of the dependent claims which could serve as a basis for new claims could be found.

- 21.) If new claims are filed, it is recommended to follow the following instructions:
- indicate in the letter of reply the difference of the subject-matter of the new claim vis-à-vis the state of the art (in particular indicate the objective technical problem solved by the invention specified in the claim) and the significance thereof.
- indicate any argument showing the presence of an inventive step.
- In order to facilitate the examination of the conformity of the amended application with the requirements of Article 34 2) b) PCT, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based. If the applicant regards it as appropriate these indications can be submitted in handwritten form on a copy of the relevant parts of the application as filed.
- cite D1 to D5 and briefly indicate the relevant background art disclosed in these documents (Rule 5.1(a)(ii) PCT).
- put the description into conformity with the new claims.

Re Item VIII

Certain observations on the international application

- 1.) In the independent claims 1,35,41,46,47, the phrase 'of the type here before' leads to a lack of clarity of each of the claims because it is not clear to which text the claims refer to. The applicant's attention is drawn to the fact that a claim should normally not refer to the description (see PCT Guidelines Section IV part III 4. 10, Rule 6.2 a)).
- 2.) The plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection. Hence claims do not meet the

SEPARATE SHEET



requirements of Article 6 PCT. It is suggested to file a single independent claim per category.

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(71) Applicants and

S990561

(72) Inventors: FRITSCH, Joseph, Frederick, [US/IE]; 21 The Sweepstakes, Ballsbridge, Dublin 4 (IE). FRITSCH,_ Roxanne, Yvonne [US/IE]; 21 The Sweepstakes, Ballsbridge, Dublin 4 (IE).

(74) Agent: F.F. GORMAN & CO.; 54 Merrion Square, Dublin 2 (IE).

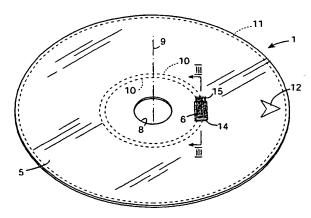
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A PROTECTIVE DEVICE



√ (57) Abstract: A protective device (1) for protecting an optical head (2) of a disc drive unit against dirt and dust and shock when the disc drive unit is not in use comprises a carrier disc (5) similar to a music CD disc for engaging in the disc receiving area of the disc drive unit. A brush member (6) located on the carrier disc (5) at a position corresponding to the inner data track (10) of a music CD disc is provided for engaging a lens (3) and a peripheral portion (7) of a lens carrier (4) of the head (2) when the head (2) is in the inactive position for protecting the lens (3) and the peripheral portion (7) against dirt and dust. Fibres (15) of the brush member (6) are of sufficient length to engage and embrace the lens (3) and the peripheral portion (7) of the lens carrier (4) when the head (2) is in the inactive position. The fibres (15) are of sufficient resilience for also protecting the head (2) against shock. The brush member (6) also cleans the lens (3) as the brush member (6) passes by the lens (3) on insertion and ejection of the carrier disc (5) in and from the disc receiving area. Further cleaning can be achieved by activating the disc drive unit for causing the head (2) to go through a number of data focusing cycles for urging the lens (3) into and out of the brush member (6).



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"A protective device"

The present invention relates to a protective device, and in particular, to a protective device for protecting an interface means, for example, a read and/or write head or a pin connector of a read and/or write unit of the type in which the interface means is provided for reading and/or writing data to or from a data carrier, such as, for example, a floppy disc, an optical disc, a data cartridge unit or an integrated circuit chip of the type which, for example, stores computer games and the like.

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In this specification the term read and/or write unit is used to include at least the following within its meaning, an optical disc drive unit, for example, a music compact disc player and/or recorder unit, a CD ROM read and/or write drive unit, a floppy disc drive, a tape drive unit, for example, a magnetic tape drive unit, such as, a tape cassette player and/or recorder unit, or a tape cassette read and/or write unit, a data cartridge tape drive unit, and a read and/or write unit of the type adapted to read and/or write, but in particular to read an integrated chip in which a computer game is stored. The term interface means is used in this specification to mean any type of interface which interfaces with a data carrier in a read and/or write unit for reading from and/or writing to the data carrier. Such interface means would at least include a read and/or write head, which may be a magnetic head or an optical head, or a combination of both. Such interface means would also include a pin and/or socket connector for connecting to a corresponding pin and/or socket connector of an integrated circuit chip of the type on which a computer game is stored. Such read and/or write units typically are provided with a receiving area for receiving the data carrier which may be, for example, a floppy disc, an optical disc, a tape cassette or a data carrier tape cassette, or an integrated circuit chip housed in a housing with a pin and/or socket connector. The interface means, typically is located in or adjacent the receiving area for interfacing with the data carrier for in turn reading and/or writing data to or from the data carrier. Such read and/or write units may be suitable for receiving data carriers on which the data is stored in digital and/or analogue form and may be for music and/or computer data, or otherwise.

Such read and/or write units are well known. As discussed above, the interface

means, typically, a read and/or write head or a pin and/or socket connector are located in or adjacent the receiving area for receiving the data carrier. In general, the read and/or write head of such units, or pin and/or socket connector are relatively fragile components and are easily damaged by, for example, shock and the like. Additionally, if the interface means of such read and/or write units become soiled with dust or dirt, in general they become inoperable. Because of the construction of many such read and/or write units, dust and dirt can readily easily collect on the interface means, and in particular, can collect on the interface means when the read and/or write unit is not in use.

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While cleaning devices are known for cleaning read and/or write heads of such units when the read and/or write units are operational, there are no protective devices which satisfactorily protect the read and/or write head when the read and/or write unit is not in use. In particular, there are no protective devices which satisfactorily protect the read and/or write head from dust and/or dirt when the read and/or write unit is not in use.

There is therefore a need for a protective device which protects an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined from dirt and dust when the read and/or write unit is not in use. It is also desirable, that the protective device should protect the interface means from shock when the read and/or write unit is not in use.

The present invention is directed towards providing such a protective device.

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According to the invention there is provided a protective device for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, wherein the protective device comprises a carrier means for engaging in the receiving area of the read and/or write unit, and a protecting means carried on the carrier means for engaging the interface means for protecting the

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interface means when the carrier means is engaged in the receiving area.

In one embodiment of the invention the protecting means is located on the carrier means at a position which when the carrier means is located in the receiving area coincides with an inoperative position of the interface means, and/or a position at which the interface means expects to find directory or other relevant data on a data carrier.

Preferably, the protecting means engages the interface means with a portion of the interface means nested into the protecting means. Advantageously, the area of the protecting means offered up to the interface means is at least of area similar to the area of the portion of the interface means to be nested into the protecting means. Ideally, the area of the protecting means offered up to the interface means is greater than the area of the portion of the interface means to be nested into the protecting means. Preferably, the area of the protecting means offered up to the interface means is such that the protecting means embraces a peripheral portion extending around the portion of the interface means to be nested into the protecting means.

In one embodiment of the invention the protecting means is resilient.

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In another embodiment of the invention the protecting means comprises a plurality of fibres extending from the carrier means for engaging the interface means. Preferably, the fibres of the protecting means are flexible. Advantageously, the fibres of the protective device are resilient. Ideally, the fibres of the protecting means are provided in the form of a brush. Advantageously, the fibres of the protecting means extend from a base member mounted on the carrier means.

In one embodiment of the invention a resilient mounting means is provided for resiliently mounting the base member of the protecting means to the carrier means.

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In another embodiment of the invention the carrier means defines a central axis for in use coinciding with a rotational axis of a data carrier in the receiving area.

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In a further embodiment of the invention the carrier means defines a carrier plane, and the fibres of the protecting means extend from the carrier means at an angle to the carrier plane of less than 90°. Advantageously, the fibres of the protecting means extend from the carrier means at an angle to the carrier plane in the range of 20° to 80°. Preferably, the fibres of the protecting means extend from the carrier means at an angle to the carrier plane in the range of 50° to 80°. Ideally, the fibres of the protecting means extend from the carrier means in a direction circumferentially relative to the central axis defined by the carrier means.

In one embodiment of the invention the protecting means extends circumferentially around the central axis defined by the carrier means.

In another embodiment of the invention the protecting means extends completely around the central axis defined by the carrier means.

Ideally, the protecting means is spaced apart from the central axis defined by the carrier means.

In one embodiment of the invention the protecting means protects the interface means from dirt and dust.

In another embodiment of the invention the protecting means protects the interface means from shock.

In one embodiment of the invention an indicating means is provided for indicating the direction in which the carrier means is to be inserted in the receiving area of the read and/or write unit. Preferably, the indicating means is provided on the carrier means. Advantageously, the indicating means facilitates alignment of the protecting means with the interface means.

In a further embodiment of the invention the protecting means is located on the carrier means for cleaning the interface means as the carrier means is being inserted in the receiving area.

In one embodiment of the invention the protecting means is located on the carrier means for cleaning the interface means when the read/write unit is activated for reading or writing data, and the interface means is being initially moved for identifying data.

In another embodiment of the invention the carrier means is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means is provided for protecting a read and/or write head forming the interface means of the read and/or write unit.

In a further embodiment of the invention the protecting means cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being initially moved for identifying data.

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In a still further embodiment of the invention the protecting means cleans the read and/or write head of the disc drive read and/or write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means into and out of the protecting means.

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In a further embodiment of the invention the protecting means is for protecting a read and/or write head provided by an optical head.

In one embodiment of the invention the protecting means is for engaging a lens of the read and/or write optical head. Alternatively, the protecting means is for protecting a read and/or write head provided by a magnetic head.

Additionally, the invention provides a method for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means having a protecting means mounted thereon into the receiving area of the read and/or write unit, and engaging

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the protecting means with the interface means when the carrier means is engaged in the receiving area for protecting the interface means.

In one embodiment of the invention the protecting means protects the interface means from dirt and/or dust.

In another embodiment of the invention the protecting means protects the interface means from shock.

In a further embodiment of the invention the protecting means cleans the interface means as the carrier means is being inserted into the receiving area.

In a still further embodiment of the invention the protecting means cleans the interface means when the interface means has been activated to identify data, and advantageously, the protecting means cleans the interface means when the interface means is being initially moved perpendicularly relative to the carrier means into and out of the protecting means for identifying data.

The invention further provides a method for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and an interface means is located in or adjacent the receiving area, the method comprising the steps of inserting the carrier means of the protective device according to the invention into the receiving area of the read and/or write unit, and engaging the protecting means with the interface means when the carrier means is inserted in the receiving area for protecting the interface means.

In one embodiment of the invention the read and/or write unit is a disc drive read and/or write unit, and the interface means is a read and/or write head.

In another embodiment of the invention the read and/or write head is an optical head. Alternatively, the read and/or write head is a magnetic head.

In a still further embodiment of the invention the method further comprises activating the read and/or write unit for causing the interface means to cycle perpendicularly relative to a plane defined by the carrier means for cycling the interface means into and out of the protecting means for cleaning the interface means.

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Additionally, the invention provides a cleaning device for protecting an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, wherein the cleaning device comprises a carrier means for engaging in the receiving area of the read and/or write unit, and a cleaning means carried on the carrier means for alignment with the interface means when the carrier means is located in the receiving area so that movement of the interface means when the read and/or write unit is activated for identifying data the interface means is moved into and out of the cleaning means for cleaning the interface means.

Further the invention provides a method for cleaning an interface means of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means having a cleaning means mounted thereon into the receiving area of the read and/or write unit with the cleaning means aligned with the interface means when the carrier means is engaged in the receiving area, and activating the read and/or write unit for causing the interface means to move relative into and out of the cleaning means for identifying data for cleaning the interface means.

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The advantages of the invention are many. By virtue of the fact that the protecting means engages the interface means of a read and/or write unit when not in use where the protective device is adapted for protecting against dirt and dust the protective device protects the area of the interface means which is engaged by the protecting means against dirt and dust over the entire period while the protective

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device is located in the receiving area of the read and/or write unit. Additionally, where the protective device is adapted for protecting the interface means against shock, while the protective device is located in the receiving area of the read and/or write unit the interface means is protected by the protecting means against shock. A further advantage of the invention is achieved when the protecting means is provided with a cleaning action, in that the protective device as well as protecting the interface means against shock and/or dirt and dust also tends to clean the portion of the interface means engaged by the protecting means.

The provision of the protecting means in the form of a brush provides a particularly desirable form of the protective device in that as well as protecting against dirt and dust, the protective device also acts to clean the interface means as the protecting means is passed relative to the interface means on being inserted into or ejected from the receiving area of the read and/or write unit. Indeed, by providing the brush of the protecting means with sufficient resilience the protective device has the further advantage of protecting the interface means against shock.

A further advantage of the invention is that it is particularly suitable for cleaning the head, and in particular, an optical head of a disc drive unit where the optical head is particularly dirty. By virtue of the fact that the only relative movement required between the head and the protecting means when the disc drive unit is activated is the movement of the head during its focusing cycles, the disc drive unit may be operated a sufficient number of times until the head has been cleaned. This is a particularly important advantage over and above those cleaning devices in which relative lateral movement, namely, relative radial and circumferential movement between the head and a cleaning means on a carrier means is required, since in many disc drive units the head of the disc drive unit will not move radially from its inactive position until data has been found on the inner data track of a CD ROM or music CD disc, or the like. Additionally, in some disc drive units the CD ROM or music CD will not commence to rotate in the event that the lens of the optical head is so dirty as to prevent any reading of data whatsoever. Essentially the device according to the invention acts as a stationary cleaning device, in other words the device cleans the interface means without movement of the device being required.

For example, when the device is adapted for protecting and/or cleaning an optical head of a disc drive unit rotation of the carrier means is not required. Cycling movement of the optical head for focusing the head is sufficient for obtaining cleaning of the optical head and/or the lens of the optical head.

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The invention will be more clearly understood from the following description of some preferred embodiments thereof which are given by way of example only with reference to the accompanying drawings, in which:

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Fig. 1 is a perspective view of a protective device according to the invention for protecting an interface means, namely, a read and/or write head of a read and/or write unit, namely, a disc drive unit,

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Fig. 2 is an enlarged perspective view of a portion of the protective device of Fig. 1,

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Fig. 3 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 1 on the line III-III of Fig. 1 illustrated in use,

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Fig. 4 is a perspective view of a protective device according to another embodiment of the invention for protecting a read write head of a read write unit,

Fig. 5 is an enlarged perspective view of a portion of the protective device of Fig. 4,

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Fig. 6 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 4 on the line VI-VI of Fig. 4 illustrated in use,

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Fig. 7 is a perspective view of a protective device according to a further embodiment of the invention for protecting a read/write head of a read and/or write unit, and

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Fig. 8 is a transverse cross-sectional side elevational view of a portion of the protective device of Fig. 7 on the line VIII-VIII of Fig. 7 illustrated in use.

Referring to the drawings and initially to Figs. 1 to 3, there is illustrated a protective device according to the invention indicated generally by the reference numeral 1 for protecting an interface means, in this embodiment of the invention a read and/or write optical head 2 of a read and/or write unit, namely, a music CD disc drive unit (not shown) such as a music compact disc player and/or recorder unit. The protective device 1 protects a lens 3 in a lens carrier 4 of the head 2 from dust and dirt, and also protects the head 2 from shock when the disc drive unit is not in use. Only the lens 3 and a portion of the lens carrier 4 of the head 2 are illustrated schematically in Fig. 3. The protective device 1 also acts as a cleaning device for cleaning the lens 3 of the read and/or write head 2 as will be described below. The protective device 1 comprises a carrier means, namely, a carrier disc 5 which is similar in size and shape to a music CD disc for engaging in a disc receiving area (not shown) of the disc drive unit. A protecting means for protecting the read and/or write head 2 comprises a brush member 6 for engaging the lens 3 of the read and/or write head 2 as well as a peripheral portion 7 of the lens carrier 4, which extends around the lens 3 adjacent the lens 3 for protecting the lens 3 against dust and dirt, and for protecting the head 2 against shock. The brush member 6 is carried on and secured to the carrier disc 5 by any suitable securing means, in this case, an adhesive.

The carrier disc 5 is provided with a central opening 8, similar to the central opening of a music CD disc, and defines a central axis 9 which when the carrier disc 5 is inserted in the disc receiving area of the disc drive unit coincides with the rotational axis of a music CD disc when similarly inserted in the disc drive unit. The brush member 6 is located at a position radially spaced apart from the central axis 9 of the carrier disc 5 which coincides with the inner data track of a music CD disc so that when inserted in the disc receiving area of the disc drive unit the brush member 6 lies on substantially the same radius as the head 2 when the head 2 of the disc drive unit is in the inactive position. The normal inactive position of an optical head of disc drive unit is aligned with the position of the inner data track of a music CD disc. The

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normal location of the inner data track of a music CD disc is indicated on the carrier disc 5 in Fig. 1 by the broken lines 10. A broken line 11 indicates the outer periphery of the area in which data is written on a music CD disc.

An indicating means provided by an arrow head 12 is printed or otherwise formed on the carrier disc 5 for indicating the direction in which the carrier disc 5 should be entered in the disc drive unit and how the carrier disc should be aligned with the disc receiving area, so that when the carrier disc 5 is fully inserted in the receiving area of the disc drive unit the brush member 6 is substantially centrally aligned with the head 2. In this embodiment of the invention the arrow head 12 is located for alignment with a head accommodating slot in a CD disc receiving tray for receiving and carrying the CD disc into the disc receiving area of the disc drive unit. Such disc receiving trays of disc drive units will be well known to those skilled in the art.

The brush member 6 comprises a base member 14, which in this embodiment of the invention is provided by woven sheet material, into which fibres 15 of the brush member 6 are woven and extend therefrom at an angle α of approximately 80° to the carrier disc 5. The fibres 15 in extending from the carrier member 5 at the angle a of 80° extend in a direction generally circumferentially relative to the central axis 9 for causing the fibres 15 to engage the lens 3 with a wiping, scouring action as the brush member 6 passes the lens 3 as the carrier disc 5 is being engaged in the disc receiving area of the disc drive unit for cleaning the lens 3. The fibres 15 are flexible, but are also resilient for resiliently engaging the lens 3 and the peripheral portion 7 of the lens carrier 4 of the head 2. The base member 14, and in turn the brush member 6 when viewed in plan are of rectangular shape, in this embodiment of the invention 20mm by 10mm. The base member 14 is secured to the carrier disc 5 with the longer dimension, namely, the 20mm sides extending circumferentially relative to the central axis 9 of the carrier disc 5, and the short dimension, namely, the 10mm sides extending radially relative to the central axis 9 of the carrier disc 5. In general, the diameter of a lens of a read and/or write optical head 2 is in the order of 5mm to 6mm diameter, and accordingly, the area of the brush member 6 when viewed in plan is considerably greater than the area of the lens 3, similarly, when viewed in plan. The fact that the area of the brush member 6 in plan view is significantly

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greater than the area of the lens 3 reduces the need for precise alignment of the brush member 6 with the lens 3. Furthermore, the fact that the brush member 6 is twice the length in a circumferential direction than in a radial direction relative to the central axis 9 of the carrier disc 5 avoids the need for precise circumferential alignment of the brush member 6 with the head 2.

Additionally, the fibres 15 of the brush member 6 are of length so that when the protective device 1 is inserted in the disc receiving area of the read and/or write unit in the direction of the arrow head 12, and when the head 2 is in the inactive position, the fibres 15 of the brush members 6 engage the lens 3, and furthermore, the lens 3 and a peripheral portion 7 of the lens carrier 4 around the lens 3 nests into the brush member 6, as can most clearly be seen in Fig. 3. This nesting effect of the head 2 into the brush member 6 has the dual effect of protecting the lens 3 and the peripheral portion 7 of the head 2 from dust and dirt while the disc drive unit is not in use, and also for protecting the head 2 against shock.

In this embodiment of the invention the fibres 15 of the brush member 6 are formed by picks or tufts, each of which comprises a plurality of texturised filaments of polyamide – 6.6, and filament diameter 2.2 DTEX ("denier"). Typically, each pick or tuft is made up of approximately fifty filaments which are grouped together, and may be twisted together. The brush member 6 comprises one pick or tuft per square millimetre. The texturizing of the filaments is carried out by heating, and provides the filaments, and in turn the picks or tufts of fibres 15 with an inherent resilience which is sufficient for providing adequate shock protection for the head 2 when the head 2 is engaged by the brush member 6. The resilience of the fibres 15 also enhances the cleaning action of the brush member 6 on the lens 3 as the brush member 6 is being wiped past the lens 3 on insertion in the disc receiving area.

The length of the fibres 15 depends on the type of disc drive unit, and the read and/or write head of which is to be protected. However, ideally, the length of the fibres 11 should be such as to allow at least 0.5 to 2mm of projection of the fibres beyond the lens 3, to ensure that the lens 3 and the peripheral portion 7 of the head 2 adjacent the lens 3 are properly nested into the brush member 6.

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In use, the protective device 1 is placed on the disc receiving tray of the disc drive unit with the arrow head 12 aligned with the head accommodating slot in the disc receiving tray. The disc drive unit is then activated for drawing the disc receiving tray, and in turn the device 1 into the disc receiving area of the disc drive unit. On the carrier disc 5 being fully drawn into the disc receiving area the brush member 6 is aligned with the head 2 of the disc drive unit when the head 2 is in the inactive position. As the carrier disc 5 is approaching its fully inserted position into the disc receiving area the brush member 6 wipes across the lens 3 of the head 2, and also the brush member 6 wipes the peripheral portion 7 of the lens carrier 4, thereby causing a cleaning action for cleaning the lens 3 and the peripheral portion 7 of the lens carrier 4. When the carrier disc 5 is fully inserted in the disc receiving area, the head 2 in its inactive position engages and nests within the brush member 6 so that the lens 3 and the peripheral portion 7 of the lens carrier 4 are embraced by the fibres 15 of the brush member 6 for protecting the lens 3 and the peripheral portion 7 of the lens carrier 4 against dirt and dust, and also for protecting the head 2 against shock.

A further cleaning action may be achieved by operating the disc drive unit when the carrier disc 5 is inserted in the disc receiving area and the brush member 6 is aligned with the head 2. On activation of disc drive unit the head 2 commences to cycle upwardly and downwardly in the directions of the arrows A and B perpendicularly relative to a plane defined by the carrier disc 5, and this upward and downward cycling movement of the head 2 causes the lens 3 and the peripheral portion 7 of the lens carrier 4 to be urged repeatedly inwardly into and outwardly from the brush member 6. This in and out cycling movement of the head 2 into and out of the brush member 6 causes the fibres 15 to wipe the lens 3 and the peripheral portion 7 of the lens carrier 4, thereby further cleaning the lens 3 and the peripheral portion 7 of the lens carrier 4. This inward and outward cycling movement of the head 2 is undertaken by the disc drive unit when the disc drive unit is powered up for causing the head 2 to focus on the data on the inner data track. By virtue of the fact that the brush member 6 is in engagement with the head 2 the head 2 fails to identify data and continues to cycle inwardly and outwardly of the brush member 6 a number

of times in an attempt to focus on data. However, after a number of repeated inward and outward cycles of the head 2 into and out of the brush member 6 the disc drive unit shuts down. This part of the operation of a disc drive unit will be well known to those skilled in the art.

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Typically, the cycling of the head 2 into and out of the brush member 6 for focusing the head 2 continues for a number of focusing cycles. The number of focusing cycles depends on the particular type of disc drive unit. However, in general, the read and/or write head of a music CD disc drive unit would cycle into and out of the cleaning brush for at least four cycles, and in many cases more than four cycles. In general, four focusing cycles of the head 2 into and out of the brush member 6 is sufficient for cleaning a moderately dusty lens. However, if the lens is heavily soiled, the disc drive may be activated a number of times so that each time the disc drive unit is activated the lens will cycle for the appropriate number of focusing cycles into and out of the brush member 6.

Additionally, in certain cases if desired a cleaning fluid which preferably, is a relatively volatile fluid may be applied to brush member 6 for further enhancing the cleaning action of the brush member 6.

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Typically, when the disc drive unit is not in use the protective device 1 is inserted into the disc receiving area for protecting the head of the disc drive unit. When it is desired to use the disc drive unit, the disc drive unit is operated for ejecting the protective device 1. However, in general, it is desirable that the disc drive unit should be activated when the protective device 1 is inserted for cleaning the lens, and may also be activated prior to ejection of the protective device 1 for also cleaning the head.

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Referring now to Figs. 4 to 6 there is illustrated a protective device according to another embodiment of the invention indicated generally by the reference numeral 20 also for protecting a lens 3 and a read and/or write head 2 of a music CD disc drive unit. The protective device 20 is substantially similar to the protective device 1 and similar components are identified by the same reference numerals. The main

difference between the protective device 20 and the protective device 1 is that instead of the brush member 6 being mounted directly onto the carrier disc 5, the brush member 6 is carried on a resilient mounting means, namely, a resilient carrier arm 21 of plastics material which is secured to the carrier disc 5 by adhesive. The carrier arm 21 is secured to a rear surface 22 of the carrier disc 5, and an circular opening 23 is provided in the carrier disc 5 for accommodating the fibres 15 of the brush member 6 therethrough. Additionally, in this embodiment of the invention the brush member 6 instead of being of rectangular shape in plan view is of circular shape. The provision of the carrier arm 21 of a resilient material, further enhances the resilient action of the brush member 6 on the head 2 for enhancing protection of the head 2 against shock.

Otherwise, the protective device 20 is similar to the protective device 1 and its use is likewise similar.

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Referring now to Figs. 7 and 8 there is illustrated a protective device according to a further embodiment of the invention indicated generally by the reference numeral 30 also for protecting a lens 3 and a read and/or write head 2 of a read and/or write music CD disc drive unit. The protective device 30 is substantially similar to the protective device 1 and similar components are identified by the same reference numerals. The main difference between the protective device 30 an the protective device 1 is that the brush member 6 instead of being provided in a rectangular or circular shape is provided in the form of an annular ring 31 which extends circumferentially around and concentrically with the central axis 9 of the carrier disc 5, and coincides with the inner data track of a music CD disc. The advantage of providing the brush member 6 to extend in the form of the annular ring 31 avoids any danger of misalignment of the brush member with the head 2.

In this embodiment of the invention the fibres 15 extend from the base member 14 at an angle α of approximately 80° in a general direction circumferentially relative to the central axis 9 in similar fashion as the fibres 15 extend from the base member 14 of the brush 6 of the protective device 1.

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Otherwise, the protective disc 30 is similar to the protective disc 1, and its operation is likewise similar.

While the protective devices have been described for protecting the read and/or write head against both shock and dust and dirt, it is envisaged that in certain cases the protective devices may be provided for protecting against one or the other, in other words, for protecting the head against either shock or dust and dirt.

Additionally, while the protective device according to the invention has been described as also having a cleaning action, while this is preferable, it is not essential.

While the brush members have been described as being surface mounted directly onto the carrier disc of the protective devices 1 and 30 of Figs. 1 to 3 and 7 and 8, it is envisaged that the base members of the brush members may be recess mounted into recesses in the carrier disc. Additionally, it is envisaged that the brush members may be mounted onto the carrier disc on resilient blocks.

While it is desirable, it will be appreciated that it is not essential that the carrier means should be similar in shape and size to a data carrier of the type used with the read and/or write unit, the carrier means may be of any desired or suitable shape. Additionally, it will be appreciated that the central opening in the carrier means may be of any desired or suitable size, and need not necessarily be of size similar to that of a central opening of a data carrier of the type used with the read and/or write unit. Indeed, in certain cases it may be desirable that the central opening should be of diameter greater than that of a normal central opening of the appropriate data carrier. Indeed, in the case of a DVD read and/or write unit in order to avoid the carrier disc rotating, it may be desirable to provide the central opening in the carrier disc of diameter greater than the diameter of a central opening of a DVD for avoiding engagement of the DVD drive with the carrier disc.

Needless to say, it is envisaged that in certain cases, the protective device may be required for protecting an optical head of a disc drive unit in which the optical head is provided with more than one lens, for example, a pair of adjacent lenses, in such cases, it will be appreciated that the area of the protecting means will be such as to

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cover the part of the head which is to be protected and to cover the two or more lenses.

While the protective device according to the invention has been described for protecting a read/write head of a music CD disc drive unit from shock, dust and dirt, and also for cleaning the read and/or write head of a music CD disc drive unit, it is envisaged that the protective device may be used for protecting and/or cleaning the head or indeed any other interface means for interfacing with a data carrier of any other read and/or write unit. For example, the protective device may be used for protecting and/or cleaning the read and/or write head of any of the following read and/or write units, CD ROM read and/or write units, digital video disc (DVD) player and/or recorder units. CD interactive drive units, Zip drive units, Jazz drive units, super disc drive units, floppy disc drive units, mini disc drive units, digital camcorders, digital cameras, audio tape drive units, data cartridge drive units, and any other read and/or write units. Where the protective device is adapted for protecting and/or cleaning the interface means of any of these read and/or write units, preferably an appropriate sized and shaped carrier mean will be provided for engaging in the data carrier receiving area of the read and/or write unit. Needless to say, the brush member will also be appropriately sized, shaped and located for engaging the portion of the interface means to be protected and nested into the brush member.

The protective device according to the invention may also be adapted for protecting a multi pin plug or socket connector in a data carrier receiving area of a read write unit of the type for receiving a data carrier cassette in which the data is stored on an integrated chip. In which case it is preferable that the carrier means would be of a shape and size corresponding to the data carrier cassette and the protecting means would be mounted on the carrier means at an appropriate location for engaging the multi pin connector.

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It will of course be appreciated that any other suitable protecting means may be provided besides a brush member for protecting the read/write head and/or other interface means from shock, dust and dirt. An advantage of providing the protecting

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means by way of a brush member is that the protective device as well as acting as a protective device also acts as a cleaning device for cleaning the lens and/or any other component of the interface means of the read and/or write unit. However, where it is desired to provide the protective device as a protective device for protecting the interface means against dirt and dust only, the resilience of the fibres of the brush member, or its resilient mounting is not as important as when it is desired that the protective device should protect the interface means against shock. The more shock protection which is required, the more resilient should be the fibres of the brush member, and/or the more resilient should be the mounting of the brush member on the carrier disc. Additionally, where it is desired to provide the protective device as a protective device against shock only, the size and area of the protecting means and in particular, its area relative to the interface means is not particularly critical, provided that its shape and area are sufficient for engaging the interface means for protecting against shock. However, where the protective device is to protect against dust and dirt, it is important that the area of the protecting means offered up to the interface means should be such as to at least cover the area of the interface means to be protected against dust and dirt.

While the fibres of the brush member have been described as comprising a plurality of texturised filaments, it is envisaged that the fibres may be formed in other ways and when formed by filaments, it is not essential that the filaments be texturised.

While the indicating means has been described as being provided by an arrow head, any other suitable indicating means for indicating how the device is to be entered in the disc receiving area may be provided in disc drive units where a CD disc is entered manually into a slot and is then subsequently drawn through the slot by the disc drive unit into the disc receiving area, it is envisaged that the indicating means may be provided by an arrow head, which would indicate the portion of the carrier disc to be initially entered in the slot, and the orientation of the disc relative to the slot. Additionally, in some disc drive units a specific indicating means may not be required due to the fact that the shape of the carrier means may facilitate self-alignment.

Claims

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- 1. A protective device for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterised in that the protective device (1,20,30) comprises a carrier means (5) for engaging in the receiving area of the read and/or write unit, and a protecting means (6) carried on the carrier means (5) for engaging the interface means (2,3) for protecting the interface means (2,3) when the carrier means (5) is engaged in the receiving area.
- 2. A protective device as claimed in Claim 1 characterised in that the protecting means (6) is located on the carrier means (5) at a position which when the carrier means (5) is located in the receiving area coincides with an inoperative position of the interface means (2,3), and/or a position at which the interface means expects to find directory and/or other data on a data carrier.
- 3. A protective device as claimed in Claim 1 or 2 characterised in that the protecting means (6) engages the interface means (2,3) with a portion of the interface means (3,7) nested into the protecting means (6).
- 4. A protective device as claimed in Claim 3 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is at least of area similar to the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6).
- 5. A protective device as claimed in Claim 3 or 4 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is greater than the area of the portion (3,7) of the interface means (2,3) to be nested into the protecting means (6).
- 6. A protective device as claimed in any of Claims 3 to 5 characterised in that the area of the protecting means (6) offered up to the interface means (2,3) is such

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that the protecting means (6) embraces a peripheral portion (7) extending around the portion (3) of the interface means (2,3) to be nested into the protecting means (6).

- 7. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is resilient.
 - 8. A protective device as claimed in any preceding claim characterised in that the protecting means (6) comprises a plurality of fibres (15) extending from the carrier means (5) for engaging the interface means (2,3).
 - 9. A protective device as claimed in Claim 8 characterised in that the fibres (15) of the protecting means (6) are flexible.
- 10. A protective device as claimed in Claim 8 or 9 characterised in that the fibres15 (15) of the protective device (6) are resilient.
 - 11. A protective device as claimed in any of Claims 8 to 10 characterised in that the fibres (15) of the protecting means (6) are provided in the form of a brush (6).
- 12. A protective device as claimed in any of Claims 8 to 11 characterised in that the fibres (15) of the protecting means (6) extend from a base member (14) mounted on the carrier means (5).
- 13. A protective device as claimed in Claim 12 characterised in that a resilient mounting means (21) is provided for resiliently mounting the base member (14) of the protecting means (6) to the carrier means (5).
 - 14. A protective device as claimed in any preceding claim characterised in that the carrier means (5) defines a central axis (9) for in use coinciding with a rotational axis of a data carrier in the receiving area.
 - 15. A protective device as claimed in any of Claims 8 to 14 characterised in that the carrier means (5) defines a carrier plane, and the fibres (15) of the protecting

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means (6) extend from the carrier means (5) at an angle to the carrier plane of less than 90°.

- 16. A protective device as claimed in Claim 15 characterised in that the fibres
 (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 20° to 80°.
 - 17. A protective device as claimed in Claim 16 characterised in that the fibres (15) of the protecting means (6) extend from the carrier means (5) at an angle to the carrier plane in the range of 50° to 80°.
 - 18. A protective device as claimed in any of Claims 15 to 17 characterised in that the fibres (15) of the protecting means (6) extend from the carrier means (5) in a direction circumferentially relative to the central axis (9) defined by the carrier means (5).
 - 19. A protective device as claimed in any of Claims 14 to 18 characterised in that the protecting means (6) extends circumferentially around the central axis (9) defined by the carrier means (5).
 - 20. A protective device as claimed in Claim 19 characterised in that the protecting means (6) extends completely around the central axis (9) defined by the carrier means (5).
- 21. A protective device as claimed in any of Claims 14 to 20 characterised in that the protecting means (6) is spaced apart from the central axis (9) defined by the carrier means (5).
- 22. A protective device as claimed in any preceding claim characterised in that the protecting means (6) protects the interface means (2,3) from dirt and dust.
 - 23. A protective device as claimed in any preceding claim characterised in that the protecting means (6) protects the interface means (2,3) from shock.

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- 24. A protective device as claimed in any preceding claim characterised in that an indicating means (12) is provided for indicating the direction in which the carrier means (5) is to be inserted in the receiving area of the read and/or write unit.
- 25. A protective device as claimed in Claim 24 characterised in that the indicating means (12) is provided on the carrier means (5).
- 26. A protective device as claimed in Claim 24 or 25 characterised in that the indicating means (12) facilitates alignment of the protecting means (6) with the interface means (2,3).
 - 27. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is located on the carrier means (5) for cleaning the interface means (2,3) as the carrier means (5) is being inserted in the receiving area.
 - 28. A protective device as claimed in any preceding claim characterised in that the protecting means (6) is located on the carrier means (5) for cleaning the interface means (2,3) when the read/write unit is activated for reading or writing data, and the interface means (2,3) is being initially moved for identifying data.
 - 29. A protective device as claimed in any preceding claim characterised in that the carrier means (5) is provided for engaging in a disc receiving area of a disc drive read and/or write unit, and the protecting means (6) is provided for protecting a read and/or write head forming the interface means (2,3) of the read and/or write unit.
 - 30. A protective device as ciaimed in Claim 29 characterised in that the protecting means (6) cleans the read and/or write head (2,3) of the disc drive read and/or write unit as the read and/or write head (2,3) is being initially moved for identifying data.
 - 31. A protective device as claimed in Claim 30 characterised in that the protecting means (6) cleans the read and/or write head of the disc drive read and/or

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write unit as the read and/or write head is being moved substantially perpendicularly relative to the carrier means (5) into and out of the protecting means (6).

- 32. A protective device as claimed in any of Claims 29 to 31 characterised in that the protecting means (6) is for protecting a read and/or write head provided by an optical head (2,3).
- 33. A protective device as claimed in Claim 32 characterised in that the protecting means (6) is for engaging a lens (3) of the read and/or write optical head (2).
 - 34. A protective device as claimed in any of Claims 29 to 31 characterised in that the protecting means (6) is for protecting a read and/or write head provided by a magnetic head (2,3).
 - 35. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means (5) having a protecting means (6) mounted thereon into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3) when the carrier means (5) is engaged in the receiving area for protecting the interface means (2,3).
- 36. A method as claimed in Claim 35 characterised in that the protecting means(6) protects the interface means (2,3) from dirt and/or dust.
 - 37. A method as claimed in Claim 35 or 36 characterised in that the protecting means (6) protects the interface means (2,3) from shock.
 - 38. A method as claimed in any of Claims 35 to 37 characterised in that the protecting means (6) cleans the interface means (2,3) as the carrier means (5) is being inserted into the receiving area.

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39. A method as claimed in any of Claims 35 to 38 characterised in that the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) has been activated to identify data.

40. A method as claimed in any of Claims 35 to 39 characterised in that the protecting means (6) cleans the interface means (2,3) when the interface means (2,3) is being initially moved perpendicularly relative to the carrier means (5) into and out of the protecting means (6) for identifying data.

- 41. A method for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and an interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting the carrier means (5) of the protective device (1,20,30) as claimed in any of Claims 1 to 34 into the receiving area of the read and/or write unit, and engaging the protecting means (6) with the interface means (2,3) when the carrier means (5) is inserted in the receiving area for protecting the interface means (2,3).
- 42. A method as claimed in Claim 41 characterised in that the read and/or write unit is a disc drive read and/or write unit, and the interface means (2,3) is a read and/or write head.
- 43. A method as claimed in Claim 42 characterised in that the read and/or write head (2,3) is an optical head (2).
 - 44. A method as claimed in Claim 42 characterised in that the read and/or write head (2,3) is a magnetic head.
 - 45. A method as claimed in any of Claims 41 to 44 characterised in that the method further comprises activating the read and/or write unit for causing the interface means (2,3) to cycle perpendicularly relative to a plane defined by the

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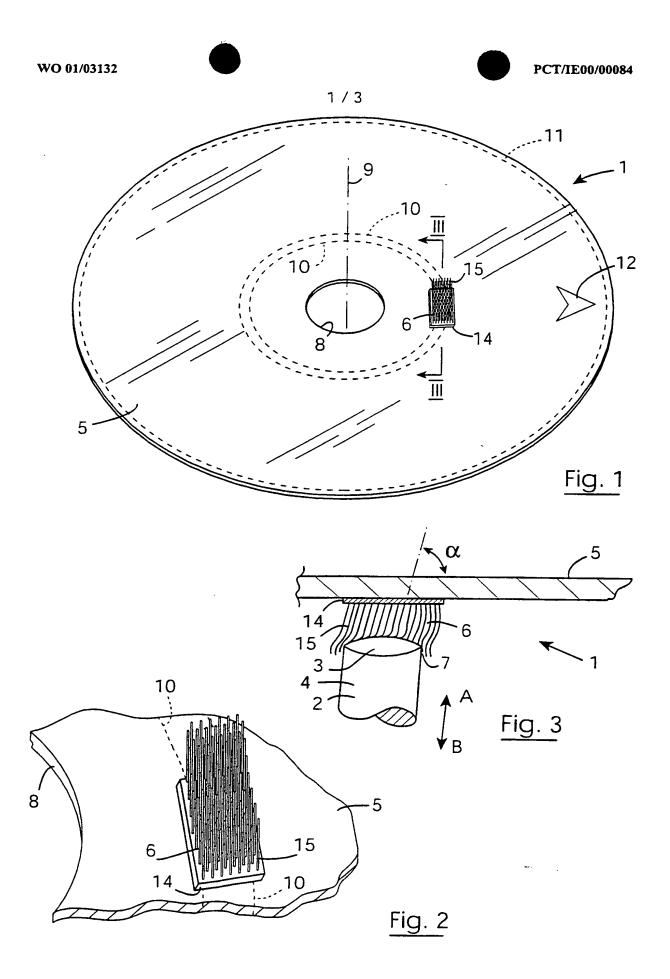
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carrier means (5) for cycling the interface means into and out of the protecting means (6) for cleaning the interface means (2,3).

- 46. A cleaning device for protecting an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined, the read and/or write unit comprising a receiving area for receiving a data carrier, the interface means (2,3) being located in or adjacent the receiving area for interfacing with the data carrier for reading from and/or writing to the data carrier, characterised in that the cleaning device (1,20,30) comprises a carrier means (5) for engaging in the receiving area of the read and/or write unit, and a cleaning means (6) carried on the carrier means (5) for alignment with the interface means (2,3) when the carrier means (5) is located in the receiving area so that movement of the interface means (2,3) when the read and/or write unit is activated for identifying data the interface means (2,3) is moved into and out of the cleaning means (6) for cleaning the interface means (2,3).
- 47. A method for cleaning an interface means (2,3) of the type hereinbefore defined of a read and/or write unit of the type hereinbefore defined in which the read and/or write unit comprises a receiving area for receiving a data carrier, and the interface means (2,3) is located in or adjacent the receiving area, the method comprising the steps of inserting a carrier means (5) having a cleaning means (6) mounted thereon into the receiving area of the read and/or write unit with the cleaning means (6) aligned with the interface means (2,3) when the carrier means (5) is engaged in the receiving area, and activating the read and/or write unit for causing the interface means (2,3) to move relative into and out of the cleaning means (6) for identifying data for cleaning the interface means (2,3).



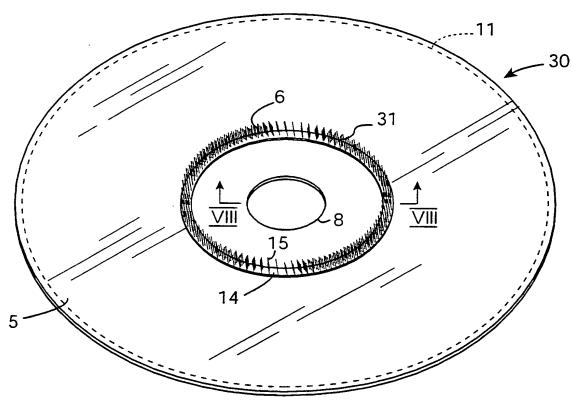
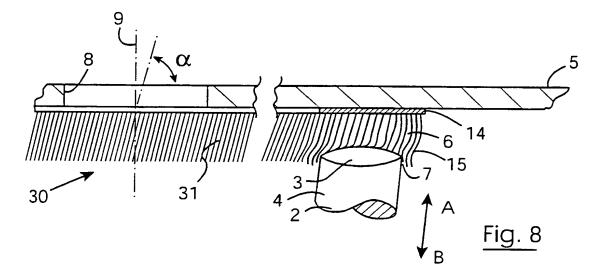


Fig. 7



PCT/II JU/00084

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G11B7/12 G11B33/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 $\label{eq:minimum documentation searched (classification system followed by classification symbols)} IPC \ 7 \ G11B$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

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X	GB 2 306 759 A (TDK CORPORATION) 7 May 1997 (1997-05-07)	1,3, 35-38, 41-44
	page 23, line 14 -page 25, line 36; figures 13-17	12.11
	-/	

Further documents are listed in the continuation of box C.	Patent family members are listed in annex.
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filling date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disc:csure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	 "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
Date of the actual completion of the international search 13 October 2000	Date of mailing of the international search report 24/10/2000
Name and mailing address of the ISA European Patent Office. P.B. 5818 Patentiaan 2 NL - 2280 HV Rijswrik Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016	Authorized officer Chaumeron, B

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